Round Pendant Around the Neck–Thyroid. A Review

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Abstract The rare situation of thyroid stone is discussed with literature review and case report. A case of isolated solitary stone of the thyroid is documented here. There are incidences of calcification in the thyroid gland commonly associated with carcinoma thyroid and multinodular goiter. But solitary stone of thyroid is reported rarely and one such case is reported from India. The possibility of malignancy is high, in case of calcification of thyroid swellings. Hence, isolated calcification should be surgically treated even if fine needle aspiration cytology is negative for malignancy.

Keywords Thyroid stone · Ring calcification · Dystrophic calcification · Papillary carcinoma · Multinodular goiter

Introduction

Multinodular goiters are very common in our subcontinent especially in the sub-Himalayan and Western Ghat areas. Hemorrhage of the multinodular goiter nodules may produce calcification. Similarly, papillary carcinoma of the thyroid can also have calcification [1, 2]. But solitary stone of the thyroid is a well-described entity with features of solitary lesion, egg shell calcification, and no other site of calcifications on the rest of the gland. Few cases of such thyroid stones are described in literature. Mostly, literature is highlighting the high incidence of malignancy in cases of calcifications, suggesting surgical treatment as the treatment of choice [2, 4, 5]. The literature reviews are few and the problem is discussed with a case report.

Clinical Presentation

A 60-year-old female patient presented with swelling in front of the neck of 10 years duration. Recently, an increasing fullness was noticed on the left sternoclavicular region with pain. There was no history of drug intake or medications for thyroid disease. There was no history of trauma. Clinically, there was a hard swelling at the left sternoclavicular region which, on ultrasound, shows a hyperechoic well-defined lesion with post-acoustic shadowing (Fig. 1). Fine needle aspiration cytology (FNAC) was attempted on the swelling but needle was not entering the lesion and hence abandoned.

Radiological study showed a ring calcification on the left lower part of the neck (Figs. 2 and 3). CT study showed heterogeneously enhancing relatively low-density well-defined lesion measuring approximately 32×24×50 mm with dense circular calcification (23×22 mm) with central lucent area noted within the lesion (Fig. 4). The left lobe was enlarged more than the right with normal texture.

Procedure A classic Kocher incision was made and the thyroid gland was explored; it showed enlarged left lobe with a solitary hard stone at the lower pole (Fig. 5). Otherwise, the gland appeared to be a colloid goiter. Considering the possibility of malignancy, total thyroidectomy was done on the left side and near total on the right side.

Gross Findings The thyroid gland was enlarged with a single globular and well-circumscribed hard mass, measuring 3 cm in diameter, located at the lower pole of left lobe with normal but enlarged lobe (Fig. 6). The right lobe appeared normal. The lesion was hard and well-defined and it was cut open to view the inside. The inside was brownish white in color and fleshy to feel (Fig. 7). The total thyroidectomy specimen was X-rayed to identify other calcifications (Fig. 8).

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Fig. 1 USG neck showing hyperechoic well defined lesion with post-acoustic shadowing

Microscopy Follicles of varying size lined by flattened epithelial cells and normofollicular cells and stroma showed fibrosis, hemorrhage, and calcification. Impression is nodular colloid goiter.

Discussion

Very few cases have been documented in literature to have calcification in thyroid with a stone formation [6]. Histologically, thyroid calcification is divided into the psammomatous and dystrophic types. Calcification of diseased gland can be hyperemic calcification or dystrophic calcification. Psammomatous calcification consists of laminated round

Fig. 2 X-ray neck AP view—ring calcification on the left lower part of neck

Fig. 3 X-ray neck lateral view—ring calcification on the left lower part of neck

calcium deposits in the epithelium. They can be detected as microcalcification in ultrasound studies. There are studies which have shown 18.5 % high incidence of papillary carcinoma in this type of calcified lesions even if the FNAC is negative. An 18.5 % higher incidence of papillary thyroid carcinoma in case of psammomatous calcification which can be detected as microcalcification on ultrasonography is now well accepted [1, 2]. By contrast, dystrophic calcification consists of nonlaminated amorphous deposits in fibrous tissue septa rather than in the epithelium. Inspissated colloid

Fig. 4 CT study showing heterogeneously enhancing relatively low-density well-defined lesion measuring $\sim 32 \times 24 \times 50$ mm with dense circular calcification (23×22 mm) with central lucent area noted within the lesion

Fig. 5 Thyroid gland showed enlarged left lobe with a solitary hard stone at the lower pole

calcifications in benign thyroid lesions may mimic microcalcifications in thyroid malignancies [1]. Peripheral calcification is one of the patterns which is most commonly seen in a multinodular thyroid, but it may also be seen in malignancy. Benign nodules have coarse calcifications, especially with long disease duration [3]. On literature review, we found that there was 18.5 % prevalence of malignancy among thyroid nodules with peripheral calcification [4], and thus, chances of malignancy were higher in patients who showed calcification in a solitary nodule. The dystrophic calcification occurs in diseased glands with nodular changes, hemorrhage, and long-standing solitary lesions. Hemorrhage into thyroid nodules is common but egg shell calcification is very rare. So much so, surgery should be recommended in such cases, regardless of the result of the fine-needle aspiration cytological findings [5]. However, there was no increase in the incidence of malignancy in the cases of multinodular goiter showing calcification.

The first report of hemorrhage into the thyroid gland is described by Simon in 1894. To date, reported cases about hemorrhage into the thyroid was caused by trauma, cervical hyperflexion, a manual blow to the back of the head, lifting a heavy weight, straining at defecation, and even during household work. Ring-shaped calcifications may simulate the

Fig. 6 Thyroid gland enlarged with a single globular and well-circumscribed hard mass, measuring 3 cm diameter located at the lower pole of left lobe with normal but enlarged lobe

Fig. 7 The lesion was hard and well-defined and it was cut open to view the inside. The inside was brownish white in color and fleshy to feel

eggshell appearance. These include aneurysms of the great vessels, parathyroid tumors, pulmonary arteries in pulmonary arterial hypertension, thymic cysts, and thyroid tumors.

Eggshell calcification of thyroid is rare and only three cases have been reported. One was an ultrasonic appearance of an eggshell calcification of a thyroid nodule reported in 1978 by Gooding and the other was eggshell calcification in follicular thyroid carcinoma reported in 2005 by Cheng et al. [7]. The last and recent one was double eggshell calcification in the thyroid in 2007 by Vandemergel [8]. Egg shell calcification is one of the patterns of dystrophic calcifications and is often associated with multinodular goiters [7]. It was generally thought to be an indicator of benignancy [7]; however, cases of papillary carcinoma [5, 7] and undifferentiated carcinoma associated with this type of calcification have been reported. In the series of Taki et al., 43 % (6 cases out of 14 cases) of this type of calcification was associated with cancer, and all of them were papillary carcinoma [9]. Typical benign nodules are well-defined, mostly cystic, and hyperechoic relative to the adjacent parenchyma (96 % benign). These nodules have eggshell calcification and a thin, echolucent halo around the entire lesion, and they always contain internal debris. Lesions demonstrating eggshell calcification and a thin echolucent halo around the entire lesion are most often benign. Some authors have found that the halo sign is present in 21–33 % of thyroid cancers. But Cheng considered that type of thyroid calcification as not a good indicator of benignancy [7].

Fig. 8 X-ray was done for the resected specimen to show no other calcification other than the stone

Frates et al. [10] reported that a rim calcification doubled risk of malignancy compared with similar nodules without calcifications and the risk of malignancy increased when a nodule was solitary and solid. However, the presence of a rim calcification showed no statistical significance in the differentiation of a malignant nodule from a benign one [11].

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